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Abstract

We assess the effect of securitization activity on banks' lending rates employing a uniquely detailed dataset from the euro-denominated syndicated loan market. We find that, in the run up to the 2007-2009 crisis banks that were more active at originating asset-backed securities did not price their loans more aggressively (i.e. with narrower lending spreads) than less-active banks. Using a unique feature of our dataset, we show that also within the set of loans that were previously securitized, the relative level of securitization activity by the originating bank is not related to narrower lending spreads. Our results suggest that while the credit cycle seems to have a major impact of lending standards, the effect of securitization activity appears to be very limited.

Keywords: Securitization, bank lending rates, syndicated loans
JEL classification: G21, G28

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1. Introduction

Securitization is often singled out as one of the major contributing factors to the 2007-2009 financial crisis (Financial Crisis Inquiry Commission 2011). Specifically it has been argued that securitization contributed to fuel excessive risk-taking by banks by weakening their lending standards (Keys *et al.* 2011).

Prior to the recent global financial crisis, however, the conventional view tended to emphasize the positive role played by securitization in enhancing the resilience of the financial system. It was argued that the use of credit risk transfer instruments, such as securitization, enabled the largest and most sophisticated banks to divest themselves of credit risk by passing it on to institutions with far less leverage, mostly by dispersing credit risk across the financial system (Greenspan 2005). Also within the banking sector, securitization was broadly believed to be employed by banks to diversify their credit risk portfolio more effectively either geographically or by sector. As a result, securitization activity was expected to make the financial system more stable as risk could be more easily managed (Duffie 2008). Consistent with these views, early empirical evidence from before the crisis found a link between securitization and lower levels of banks' risk. Banks more active in the securitization market were also found to have lower solvency risk as well as higher profitability [(Duffee & Zhou 2001); (Cebenoyan & Strahan 2004); (Jiangli *et al.* 2007)].

An alternative view on securitization focused on the possible negative consequences for the stability of the financial system. In particular, this view argues that securitization could compound adverse selection and moral hazard problems in banking leading to poorer screening standards as well as weaker monitoring of borrowers. Mostly building on this argument, there was a more skeptical view on the final impact of securitization on the financial system which underlines that securitization would not necessarily lead to credit risk diversification, but could promote the

retention of risky loans by banks and undermine overall credit standards [(Greenbaum & Thakor 1987); (Gorton & Pennacchi 1995); (DeMarzo 2005); (Instefjord 2005); (Morrison 2005); (Rajan 2006) ; (Chiesa 2008); (Krahnen & Wilde 2008); (Parlour & Plantin 2008); (Shin 2009)]. A related view suggests that by making illiquid loans liquid, securitization also could enhance, other things being equal, banks' risk appetite more broadly thereby endangering financial stability [(Calem & LaCour-Little 2004); (Ambrose *et al.* 2005); (Haensel & Krahnen 2007); (Wagner 2007); (Brunnermeier & Sannikov 2014)].

Following the 2007-2009 financial crisis, evidence on the link between securitization and bank risk-taking has grown but remains ambiguous. Part of the literature argues that banks resorting to securitization activity relaxed their lending standards in the years prior to the crisis more aggressively [(Drucker & Mayer 2008); (Mian & Sufi 2009); (Nadauld & Sherlund 2009); (Keys *et al.* 2011); (Dell'Ariccia *et al.* 2012); (Wang & Xia 2014)]. In contrast, Shivdasani and Wang (2011), Benmelech *et al.* (2012), Casu *et al.* (2013) do not find any evidence suggesting that securitization led to riskier lending.

We contribute to this literature by assessing the impact of banks' securitization activity on their lending function and, in particular, on their lending rates.[1] We test this link at two levels. We start by examining the pricing behavior of banks in the syndicated loan market by comparing banks active in the securitization market to those who are non-active in this market.[2] This approach has the advantage of examining banks' lending standards by including first-hand information on bank, borrower and loan conditions. This should, in turn, give an indication of banks' changes in risk-

[1] In this paper we use pricing of loans, lending spreads and lending rates interchangeably to refer to the lending rates over libor as priced by the bank leading the syndicate.

[2] Syndicated lending, where two or more banks agree jointly to make a loan has evolved into one of the world's largest financial markets. In a typical syndicated loan, "arranger" (or "senior") banks are situated at the core of the process. They help to put together the deal on a given set of terms and sell parts of the loan to "participant" (or "junior") second tier banks, as well as other investors, while assigning some of the loan to themselves.

taking appetite. We select a group of 406 broadly similar European banks – 94 of which were active in the securitization market –, and 10,911 syndicated loan deals for the period ranging from 2000 to 2009.

We find that in the run up to the 2007-2009 crisis, banks that were more active at originating asset-backed securities did not price their loans more aggressively (i.e. with narrower lending spreads) than non-active banks. Our results also show that larger banks with relatively smaller securitization-origination programs seem to be somewhat more aggressive than other banks in their loan pricing.

In our second step we consider only those banks that are already active as originators in the securitization market and include only those loans that were securitized. This step aims to reduce possible concerns about self-selection across banks or instruments connected to securitization by considering only the variability within those banks that are already active in the securitization market, and within those loans which have been securitized. We are able to do this by using a unique and comprehensive dataset, not publicly available, provided by the main European Trustees which allows us to identify those syndicated loan transactions that were securitized. This section of the data is available for all euro-denominated syndicated loans issued between 2005 and 2009. Hence it crucially includes both the pre and crisis periods. Our final dataset includes 4,652 loan deals, of which 1,795 are subsequently securitized.

We show that, within the set of loans that were securitized, the amount of securitization activity by the originating bank is not related to lower loan spreads. Our results consistently suggest that broad credit cycle conditions seem to be far more correlated with looser credit standards (measured via lending rates) than banks' securitization activity.

The coverage and quality of our data constitute two significant contributions to the existing literature. Our sample has been obtained directly from the largest trustees operating in the European Union and covers the overwhelming majority of the syndicated loans issued in euro.[3] This is an important advantage, as compared to previous work, where data was limited to public deals reported by publicly available sources. In contrast, we are able to form a more complete picture of the market which includes public, as well as private deals. We also construct a large sample of banks from Europe (which we matched with their amount of securitization activity and loans granted) which allows us to control for other bank characteristics.

The European focus is another significant contribution of this work. The European Union is a useful laboratory to assess the impact of securitization on credit markets. First, the growth of the securitization market in the European Union has been relatively recent and swift. This allows us to assess more clearly the impact of this recent phenomenon (securitization) on lending standards. This stands in stark contrast to the United States, where the introduction of securitization has been much more progressive and continuous over time. In fact, securitization has been used as a technique for more than fifty years in the United States, while in Europe the securitization markets started very timidly in the late 1990s, and took off significantly only from 2004 to 2007.

Second, unlike in the United States, where institutions such as Fannie Mae and Freddie Mac have supported the securitization market, the development of the securitization market in the European Union has not been driven by government-sponsored institutions.[4] This is helpful for our purposes as the existence of government-sponsored agencies probably has an important impact on banks' incentives to securitize assets in the United States.

[3] Our coverage is estimated by the main trustees to be above 95% of all securitized deals.

[4] In the United States the market for ABS started to develop by means of government-sponsored agencies such as the Federal National Mortgage Association, a.k.a. Fannie Mae, and the Federal Home Loan Mortgage Corporation, a.k.a. Freddie Mac, created in 1938 and 1968, respectively. These agencies enhanced mortgage loan liquidity by issuing and guaranteeing, but not originating, ABS. See Acharya *et al.* (2014) for a discussion.

Third, the strong growth in securitization activity in the European Union coexisted with a very large covered bond market which provided European banks with a source of long-term market funding alternative to securitization (ECB 2011). In this respect, in the aftermath of the crisis, the set-up of a legislation supporting the covered bond market in the United States has been often considered [(Pollock 2011); (Marlatt & Pinedo 2013)]. Hence, our setting in an area in which both markets coexist provides useful evidence for countries (such as the United States) considering the creation of an active covered bond market.

Fourth, our focus on the European Union banks allows us to test the effect of securitization across countries. Hence our results cannot be ascribed to country specific institutional or regulatory features. At the same time, our decision to analyze securitization in the European Union as a whole seems appropriate as the introduction of the euro contributed to the creation of a single financial market for both euro-denominated syndicated loans and securitization activity in this region.

Finally, in terms of volume, securitization activity in the European Union is also sufficiently large both in terms of the total amount of credit securitized (Marques-Ibanez & Scheicher 2009) and in outstanding figures as the euro-denominated securitization market is the second largest in the world (Blommestein et al. 2011).[5] This supports the internal validity of our findings in addition to providing additional evidence to the existing results from the United States.

The remainder of this paper is organized as follows, Section 2 reviews the related literature on the effects of securitization on lending standards and risk-taking behavior. Section 3 describes the data sources, reports the descriptive statistics of our sample and explains the empirical methodology used in the analysis. The results of estimations are presented and discussed in Section 4. Section 5 concludes.

[5] In 2006, just before the financial crisis, the annual net flow of euro-denominated asset-backed-securities (ABS) was above one-fifth of the bank loans granted to households and non-financial companies during that year.

2. Literature review

Traditional securitization can be broadly defined as the process whereby individual bank loans and other financial assets are bundled together into tradable securities, which are then sold on to investors. The development of securitization has permitted banks to "off-load" part of their credit exposure to outside investors thereby lowering regulatory pressures on capital requirements, and enabling them to raise new funds and increase lending further. The advent of securitization has therefore changed banks' role progressively from traditional relationship-based lending towards originators and distributors of loans. This new role would be expected to have implications for banks' incentives to take on new risks.[6]

In principle, the overall view prior to the 2007-2009 crisis was that securitization improved financial stability by smoothing out risks among many investors (Duffie 2008). Scant early empirical evidence also pointed in this direction. For instance Cebenoyan and Strahan (2004) find that banks improve their ability to manage credit risk through loan sales, while Jiangli et al. (2007) argue that securitization increases bank profitability and reduces insolvency risk.

Securitization also has a direct positive impact on the quantity of loans supplied by banks. Loutskina and Strahan (2009) and Loutskina (2011) find that securitization reduces banks' holdings of liquid securities and increases their lending ability, while Hirtle (2009) provides evidence suggesting that the use of credit derivatives is associated with greater supply of bank credit and lower spreads for large corporate borrowers. For Europe, Altunbas *et al.* (2009) conclude that banks active in the securitization market also seem to supply more loans.

[6] Rapid developments in securitization markets altered banks' role. Banks have long been recognized as "special" because of their ability to act as intermediaries between borrowers and depositors and transform illiquid assets into liquid deposit contracts. Conventionally, bank lending was typically conducted on the basis of a bank extending a loan to a borrower, holding the loan on their balance sheet until maturity and monitoring the borrower's performance along the way. In this relationship-based model, banks reduced idiosyncratic risks mainly through portfolio diversification and performed the role of delegated monitors for less informed investors [(Diamond 1984); (Ramakrishnan & Thakor 1984); (Bhattacharya & Chiesa 1995); (Holmstrom & Tirole 1997)].

Other studies questioned the effect of securitization on the screening and monitoring incentives of banks. The theory of financial intermediation has placed special emphasis on the role of banks in monitoring and screening borrowers thereby mitigating moral hazard between borrowers and lenders [(Diamond 1984); (Fama 1985); (Boyd & Prescott 1986)]. By creating informational "distance" between the loan's originator and the bearer of the loan's default risk, securitization can potentially reduce lenders' incentives to carefully screen and monitor borrowers (Petersen & Rajan 2002). As a result, some researchers associate loan sales and securitization to looser credit monitoring incentives by banks [(Gorton & Pennacchi 1995); (Duffee & Zhou 2001); (Morrison 2005); (Chiesa 2008); (Parlour & Plantin 2008)].

Part of the most recent empirical literature questioned whether securitization activity makes the acquisition of further risk more attractive for banks. In this direction, in Europe Krahnen and Wilde (2008) report an increase in the systemic risk of banks after securitization and Michalak and Uhde (2013) show that securitization has a negative impact on banks' financial soundness. Goderis *et al.* (2007) find that a bank increases its loan-to-asset ratio following the first issuance of a collateralized loan obligation (CLO),[7] while Instefjord (2005) highlights that when the bank has access to a richer set of tools to manage risk than before, it behaves more aggressively in acquiring new risks. Haensel and Krahnen (2007) find also that activity in the European collateralized debt obligation (CDO) market enhances the risk appetite of the bank making use of securitization. Looking at the pricing of securitized loans, Nadauld and Weisbach (2012) show that securitized loans were priced 17 basis points lower than un-securitized ones.

Higher risk appetite is also related to the possibility of undertaking regulatory capital arbitrage by banks. In this respect, securitization has often been used by banks to lower their

[7] Foos *et al.* (2010) show that bank loan growth leads to higher bank risk, including a worsening of the risk-return structure and worse (i.e. lower) bank solvency.

regulatory needs for costly equity capital charges related to their loan book, thereby reducing their overall cost of financing (Watson & Carter 2006). At the same time, banks may have an incentive to securitize less risky loans thereby increasing their risk profile for a given level of capital (Calem & LaCour-Little 2004). This behavior derives from the existence of capital requirements which might induce banks to exploit the benefits of securitizing assets in order to undertake regulatory capital arbitrage. Through securitization banks can potentially increase capital adequacy ratios without decreasing their loan portfolios' risk exposure. In other words, banks may securitize less risky loans and keep the riskier ones. Ambrose *et al.* (2005) show that securitized loans experienced lower ex-post defaults than those retained in banks' balance sheets. In this direction Albertazzi *et al.* (2015) showed that in Italy banks can effectively counter the negative effects of asymmetric information in the securitization market by selling less opaque loans via signaling or by building up a reputation for not undermining their own lending standards.

While risk sharing within the financial sector (through securitization and derivatives contracts) contributes to diversify risks, it can also amplify bank risks at the systemic level (Brunnermeier & Sannikov 2014). Allen and Carletti (2006) show that credit risk transfer could produce a reduction of welfare the promulgation of contagion at the systemic level. Wagner (2007) shows that the greater liquidity of bank assets achieved through securitization, paradoxically, increases banking instability and the externalities associated with banking failures as banks have stronger incentives to take on new risks. The reason is that securitization makes crises less costly for banks and, as a result, banks have an incentive to take on new risks offsetting the positive direct impact of securitization on bank stability.

In sum, this strand of the literature argues that securitization does not necessarily lead to unlimited risk transfer and could undermine banks' monitoring incentives. Hence, it may weaken financial stability.

Following the 2007-2009 crisis, empirical evidence examining the relationship between securitization and risky lending practices has expanded but remains ambiguous and mostly focused on the United States. Keys *et al.* (2011) show that banks that resorted to securitization activity in the years prior to the crisis seem to have relaxed lending standards by more. Nadauld and Sherlund (2009) and Dell'Ariccia *et al.* (2012) link the sub-prime mortgage crises to a sharp decline in lending standards in the United States. This decline was more prevalent in areas with higher mortgage securitization origination (Mian and Sufi, 2009).

Other studies do not find such evidence. For example, Benmelech *et al.* (2012) investigate whether securitization was associated with risky lending in the corporate loan market by examining the performance of individual loans held by collateralized loan obligations. They find that loans securitized before 2005 performed no worse than comparable non-securitized corporate loans originated by the same bank. Shivdasani and Wang (2011) argue that an increase in securitization did not lead to riskier leveraged buyouts. Casu *et al.* (2013) conclude that the net impact of securitization on the risk-taking behavior of issuing banks, and consequently on the soundness of the banking system, is ambiguous and will depend on the structure of the transaction.

3. Methodology and data

We start our analysis at the bank level by considering whether banks active in the securitization market were pricing similar loans differently than non-active banks using evidence from the syndicated loan market. In other words, we examine if banks making greater use of the

securitization market were more aggressive in their loan pricing. Hence we use the pricing of newly extended loans (measured as the spread charged) as a potential proxy for banks' credit standards after securitization.

Building on earlier literature we include *loan spread* at the loan level so we model loan *i* by bank *b* at time *t*, as a function of a number of factors [(Carey & Nini 2007); (Ivashina 2009)], where *loan spread* is measured as the spread on basis points over LIBOR.[8] We use the all-in drawn spread (*AISD*) which measures the interest rate spread plus any associated fees charged to the borrower.[9] Thus, *AISD* is an all-inclusive measure of loan price which is expected to depend on borrower, loan and macroeconomic characteristics as well as a variable accounting for the intensity of securitization activity (see below). We estimate the following model:

$$\begin{aligned} loan\ spread_{i,b,t} = {} & \beta_0 + \beta_1 Securitization\ active_{b,t} \\ & + \sum_{j=1}^{J} \beta_j \times Loan\ terms_{j,i,b,t} + \sum_{h=1}^{H} \beta_h \times Bank\ characteristics_{h,b,t} \\ & + \sum_{s=1}^{S-1} \beta_s \times Loan\ purpose_{s,i} + \sum_{k=1}^{K-1} \beta_k \times Borrower\ credit\ rating_{k,i} \\ & + \sum_{l=1}^{L-1} \beta_l \times Borrower\ industry_{l,i} + \sum_{y=1}^{Y-1} \beta_y \times Year_{i,y} + e_{i,b,t} \end{aligned}$$

We utilize two set of alternative variables to proxy for the securitization activity of banks:

[8] Note that syndicated loans typically carry floating rates that are priced over LIBOR usually in 6 month intervals. Re-pricing is done in relation to changes in LIBOR and the spread remains the same, reflecting the risk of both deal and borrower.
[9] See e.g. Sufi (2007), Ivashina (2009), and Bharath *et al.* (2011).

1. *Securitization active* takes the value of 1 if a bank securitized any assets in the year when the loan is syndicated and 0 otherwise. This variable measures the immediate impact of a bank's securitization activity on loan pricing.
2. We calculate two dummy variables using each bank's level of securitization activity. First, we calculate the relative size (i.e. as a percentage of total assets) of total securitization activity of each bank active in the securitization market between 2000 and 2009. Then we calculate two dummy variables, *less active* and *more active*, to classify these banks into two groups. *Less active* takes the value of 1 if the bank's securitization level is below the median value of all banks' securitization volume and 0 otherwise. *More active* takes the value of 1 if the bank's securitization level is above the median value of all banks' securitization volume and 0 otherwise.

We account for bank specific characteristics by taking into account bank size (measured as total assets), capital (measured as the ratio of total equity capital to total assets) and profitability (measured as return on assets). We also control for factors related to loan characteristics including loan size, maturity, guarantees and collateral. *Loan size* is measured as the natural logarithm of the syndicated loan size. *Maturity* is the duration of the loan in years. Loans with duration shorter than 1 year are classified as short-term while loans with an initial maturity longer than three years are classified as long-term. *Guarantee* is a dummy variable taking the value of 1 if the loan is guaranteed and 0 otherwise. *Collateral* is a dummy variable taking the value of 1 if there is any collateral pledged for the loan and 0 otherwise. *Loan purpose* is a set of dummy variables that varies according to the purpose of the loan: general corporate use, capital structure, project finance, transport finance, corporate control and property finance.

We also account for the credit quality of the borrower and its industrial sector via a first set of dummy variables reflecting the median credit rating of the borrower as identified by the three largest credit rating agencies (Moody's, Standard and Poor's and Fitch) at the time of issuance.[10]

[10] We standardize the credit ratings using descriptors of each category provided by rating agencies.

Business sector is a set of dummy variables related to the business of the borrower.[11] Finally, we also control for the macro environment including *Year* dummy variables.

We construct our dataset by combining data from three different sources. Securitization data are obtained from Dealogic (Bondware), a private commercial data provider, and completed with private confidential data on securitization activity obtained from Standard and Poor's (S&P) which allows us to include also private deals. We have manually matched information on deal-by-deal securitization issuance to each euro-area originating bank.[12] The advantage of using data on securitization activity from Bondware and S&P is that the name of the originator, date of issuance and deal proceeds are all registered. We include funded ABS securities as well as cash-flow (balance-sheet) CDOs issued by euro-area originating banks. Overall the securitization dataset covers 10,911 tranches between 2000 and 2009.

We expand the database significantly by identifying those syndicated loan deals that were eventually securitized. This is done by resorting to a unique database constructed by collecting deal-by-deal confidential information from all major European Trustees for all loans issued between 2005 and 2009. 1,795 out of 4,652 syndicated loans extended during this period are subsequently securitized.

Data on syndicated loan deals are obtained from Dealogic (Loanware), a commercial database which contains detailed information on syndicated loan contracts. Dealogic provides information on each syndicated loan including maturity, loan size, collateral, presence of guarantees, loan purpose, identification of the borrower, as well as the number of banks involved in the syndicate. The database also indicates the business sector and the credit rating of the

[11] Defined as follows: Construction and property, high-tech industry, infrastructure, population related services, state, manufacturing and transport.

[12] To our knowledge the existence of government sponsored agencies complicates the creation of such a database matching securitization origination to individual banks in the United States.

borrower. Finally, banks' balance sheet and income statement information are obtained from Bankscope, a commercial database maintained by International Bank Credit Analysis Ltd. (IBCA) and the Brussels-based Bureau van Dijk.

In constructing the dataset, we include, first, all syndicated loans for which the main variables on loan terms and borrower details are present. Second, we extract the reported participant European banks' names that have been involved in these loan syndicates. Syndicated loans' information at the individual deal level is subsequently matched with extensive data on individual banks' characteristics obtained from Bankscope on a yearly basis. For example if *Loan i* is issued by *Bank X, Bank Y* and *Bank Z* in *2007* and *Loan j* is issued by *Bank X* and *Bank Q* in 2008 then these combinations of loans and banks are matched as follows:

Loan i's terms and borrower's data for 2007 + Bank X's data for 2006
Loan i's terms and borrower's data for 2007 + Bank Y's data for 2006
Loan i's terms and borrower's data for 2007 + Bank Z's data for 2006
Loan j's terms and borrower's data for 2008 + Bank X's data for 2007
Loan j's terms and borrower's data for 2008 + Bank Q's data for 2007

Overall this process generated 84,926 deal-matched observations. As indicated, these three data sources do not share a unique identifier, all the data is laboriously matched via the banks' names. We present a summary descriptive statistics related to the sample in Table 1.

4. Results

4.1 Baseline model

We run the model presented in section 3 that considers the impact of bank securitization activity on the price of syndicated loans and progressively introduce controls for bank characteristics while employing the two different sets of variables accounting for securitization activity separately. We

run our estimates with and without banks' fixed effects and re-run the model including clustered errors at the bank level.

Results in Table 2 show that banks active in the securitization market priced their loans more aggressively compared to banks that do not securitize their assets. That is we find that *securitization active* is negatively associated with the *loan spread*. Being more or less active in the securitization market does not change the signs of the coefficients. Both groups of banks charge lower spreads when compared to banks that are not active in the securitization market. Similarly, controlling for bank characteristics does not change the results but suggests that loans with shorter maturity and larger size are more aggressively priced. The estimations including bank fixed effects show that within securitizing banks most of the relationship between securitization and pricing of loans occurs within the group of *less active* banks (i.e. those less active in the securitization market). That is, the group of banks active in the securitization market with a relatively low level of activity in this market compared to their peers appears to charge lower spreads compared to non-active banks.[13]

4.2 Bank size effects

Next we investigate whether bank size has an influence on pricing. We analyze the size effects by dividing the banks into two main groups defined as large and small.[14] Results are presented in Table 3. For small banks we do not see that being active in the securitization market has an impact on loan pricing. Similarly, the variables *less active* and *more active* are also not relevant for smaller institutions. That is, for small banks securitization activity plays no role on loan pricing. In contrast, for larger banks we find a negative relationship between the *securitization active* variable and *loan spreads*. Larger banks seem to be charging lower spreads when extending new loans if they are active in the securitization market. This finding would be consistent with the

[13] As a robustness check and to see whether unobserved bank and loan effects influence the results, we run estimations clustering standard errors by bank and loan. Results do not change and remain robust in these models.
[14] We group the banks by using the median assets' size.

idea that larger banks might be better able to diversify or manage credit risk and could therefore grant credit to borrowers at lower costs. Accordingly, we further develop our framework to include the securitization variables accounting for volume of activity. The results for the last two models (also in Table 3) show that particularly for larger banks most of the negative impact of securitization on loan spreads continues to take place for banks that are active in the securitization market but are relatively less active than their peers. Results including bank characteristics suggest that larger banks actually price their loans less aggressively than smaller institutions. Overall, then the argument emphasizing the possibility of risk diversification does not seem to be corroborated by our results.

4.3 The effect of pre-crisis period

We also consider how banks' pricing behavior due to securitization might change in relation to the business or credit cycles as there is evidence suggesting that lending standards change significantly with macroeconomic conditions (Demyanyk & Van Hemert 2011). In this respect, it is particularly important to observe bank behavior for the period prior to the recent credit crisis as it has been often advocated that during this period banks increased their risk-taking behavior on many fronts. More specifically, it has been argued that banks lowered their lending standards in the years leading up to the crisis, a phenomenon that coincided the increases in securitization activity during this period. (Maddaloni & Peydró 2011). We observe bank behavior in the pre-crisis period using a dummy variable, *pre-crisis period*, which equals 1 for the period ranging from January 2005 to June 2007 and 0 otherwise. To take this analysis one step further, we also interact our pre-crisis dummy with the securitization variables. Results are presented in Table 4.

For all estimations we find an overwhelmingly negative, systematic and strong relationship between the *pre-crisis* dummy and loan spreads. Banks were charging significantly lower spreads prior to the financial crisis compared to the rest of our sample period of analysis. Surprisingly, none of the interactions between the securitization activity variables and the pre-crisis period seem

to be relevant. All these findings are further confirmed when we split our sample across bank sizes (Table 5). The only interesting exception is the significant and negative coefficient for the interaction variable *pre-crisis * securitization active,* which however loses its significance when we control for bank fixed effects. Overall we do not find any evidence at the bank level linking securitization activity and lending standards measured via the cost of corporate credit in the years prior to the financial crisis.

4.4 Securitized versus non-securitized loans

We expand the analysis using an individual deal-by-deal database that is able to select among all syndicated loans, those deals that were eventually securitized. Our objective is to ascertain whether those loans that were securitized were also granted at lower rates than those not securitized. For this latter exercise we have a smaller number of observations as compared to earlier tables because the dataset includes only the loans that were issued between 2005 and 2009 so the number of observations drops compared to the earlier Tables. We estimate the baseline models separately for securitized and non-securitized loans. In other words, in order to avoid self-selection issues we focus only on institutions which are *already* active in the securitization market and include only those loans that are securitized. Within those loans and for those institutions we consider whether more activity at the bank level in the securitization market involves a more aggressive lending rates.

Results (presented in Table 6 under the label *securitized* loans) are consistent with our previous findings. We do not find significant results for more active banks. Instead in this setting we find that banks that are less active in the securitization market were pricing loans at lower spreads. For non-securitized loans, we also observe similar results.

Table 7 replicates the previous Table but focuses on the larger banks. Findings remain valid even for this reduced sample. We find that among banks active in the securitization market, larger institutions making less use of the securitization market charge lower loan prices regardless of whether they are securitized or not. In large banks underpricing is more prevalent for loans which are not securitized and are kept in banks' books. Indeed the coefficient of the variable *less active*, shows that the negative loan spread due to securitization, decreases from -11.02 basis points to -21.64 basis points for those loans that are not-securitized.

We then examine the impact of the pre-crisis period on loan pricing only for the larger institutions by utilizing pre-crisis dummies and interaction variables. The results presented in Table 8 show that for securitized loans the variable *less active* loses its significance and the pre-crisis dummy variable continues to be negatively related to loan price. We find that the interaction variable *pre-crisis * less active* and *pre-crisis * more active* is not significant for securitized loans. On the other hand, for non-securitized loans the coefficients of the *pre-crisis * less active* dummy variable becomes positively related to spread. Also here, the results are consistent with earlier findings suggesting that securitization do not seem to have an impact on loan spreads.

One interesting finding regards the estimations for the non-securitized loan sample which shows a negative relationship between *less active* and *loan spread*. More importantly we observe a larger (and significant) coefficient for *pre-crisis period* dummy variable. The interaction variable *pre-crisis period * less active* is also significant. Although it is reported to be positive, the impact of the interaction variable on the dependent variable should be interpreted by combining the coefficients of variables *pre-crisis period, less active* and *pre-crisis period * less active* [for the most controlled estimations this would be (-28.93)+(-97.20)+(22.00) = (-104.13)]. The interaction

variable amplifies the impact of securitization activity on the loan price during the buildup period before the 2007-2009 financial crisis.

Overall, we find only somewhat suggestive microeconomic evidence suggesting that securitization had an impact on lending standards as measured by the adjusted cost of corporate credit on the syndicated loan market. This stands in contrast with evidence for the United States on the corporate loan market (see Nadauld & Weisbach 2012). It is however in line with recent evidence that suggests that adverse selection problems in loan securitizations may be less severe than commonly believed [(Benmelech *et al.* 2012); (Albertazzi *et al.* 2015)].

We do, however, find some limited evidence pointing towards more aggressive pricing for large banks that are relatively less active in the securitization market. This evidence is broadly in line with findings by Instefjord (2005) and Haensel and Krahnen (2007). Tentatively one possible explanation for these latter results might be related to reputational factors. Namely, for banks that are more active in the securitization market and are regularly originating credit to be securitized, their continuity in terms of their fee income (and overall business model) might depend to a large extent on maintaining the quality of the assets underlying these deals. Hence in order to preserve their reputational capital they might be less likely to be aggressive risk takers by underpricing those loans that are to be securitized [(Kawai 2014); (Hartman-Glaser 2011)]. In contrast, banks which are less dependent on the securitization market might have a more opportunistic behavior. They might price credit risk more aggressively particularly during periods with lower credit risk aversion at the macroeconomic level in which there might be stronger investors' demand for securitized assets.

Overall our results overwhelmingly suggest that the remarkable increase in price aggressiveness in the syndicated loan market in the run up to the 2007-2009 crisis seems to be

mostly driven by macroeconomic factors rather than by the extent or degree of participation in the securitization market by individual banks. That is, we do not find that banks, relying more strongly on securitization for funding purposes, lowered their lending standards more aggressively than their peers during this period. The results at the loan level complement and support our earlier findings. Securitized loans sold to other investors through CLOs originated by banks which are more active in the securitization market are not priced more aggressively than those originated by banks which are less active users of the securitization market for funding purposes.

Interestingly loans that are not securitized and kept on the originating banks' books seem to be priced more aggressively than those securitized. This is partly in line with the signaling literature that suggests that banks might have an incentive to retain lower quality loans and package and sell off to investors better quality ones. [(Greenbaum & Thakor 1987); (DeMarzo 2005); (Instefjord 2005)].[15] Another possibility is that banks are no more skilled than the financial markets in assessing the credit quality of borrowers as loans kept in the originating banks' books seem to have been underpriced by more.

5. Conclusions

Securitization has been under intense scrutiny for potentially fueling credit growth by lowering credit standards thereby possibly inducing excessive risk taking by banks [(Shin 2009); (Farhi & Tirole 2012); (Financial Crisis Inquiry Commission 2011)]. We explore the nexus between securitization and lending by examining the pricing of new loans by European banks. We pursue two complementary approaches that include comprehensive information at the level of individual

[15] Overall, the discrepancy in lending standards among securitized and non-securitized loans can arise if there are "unsuspecting" investors unable to fully evaluate the credit quality ex-ante (Gennaioli *et al.* 2012). It could also possible that the investors investing in securitized assets have an incentive to herd even if the interest rates on the securitized assets differ from their fundamentals (Shleifer & Vishny 1997).

banks and of deals. We construct a wide sample of 84,926 matched bank-loan observations that allows us to control for lender, borrower and loan characteristics. In addition, a unique feature of our dataset is that we can identify those individual syndicated loan deals that were eventually securitized.

We do not find that banks active in the securitization market were pricing loans more aggressively than other institutions. We do find, however, that large banks that make use of the securitization market but are relatively less active in this market than their peers may charge lower spreads when extending new loans.

Probably more importantly, our findings also show that in the run up to the 2007-2009 financial crisis, banks relying on securitization did not lower their lending standards more aggressively than other institutions. That is, banks, making use of the securitization market for funding purposes, did not lower the cost on credit in the syndicated loan market more than their peers during this period. The results at the loan level complement and support these findings. Securitized loans originated by banks which are more active in the securitization market are not priced more aggressively than those originated by banks which are less active users of the securitization market for funding purposes.

Our results seem to point to a limited role for securitization in encouraging more aggressive risk-taking by banks while the role played by the credit cycle in lowering credit standards seems more economically significant. It is however hard to be conclusive because the large increases in securitization activity in most European countries might have contributed in amplifying the credit cycle in a manner not fully identifiable at the microeconomic level. From a policy perspective our results seem to support the introduction of macro prudential policies aimed at smoothing the credit

cycle. Hence, regulatory actions that aim to improve the incentive structure in the securitization process probably would need to incorporate the impact of the state of the credit cycle as well.

Table 1

Descriptive statistics[1]

Bank characteristics	Number of banks	Mean	Median	Std. dev.
All banks				
Total assets	406	116,512	12,717	322,460
Equity capital to total assets	406	8.41	6.56	9.31
Return on assets	406	0.64	0.56	1.14
Securitization active banks				
Total assets	94	173,628	31,179	368,487
Equity capital to total assets	94	7.12	6.41	6.12
Return on assets	94	0.71	0.63	1.34
Securitization non-active banks				
Total assets	312	79,043	6,830	300,634
Equity capital to total assets	312	9.56	6.77	11.43
Return on assets	312	0.61	0.51	1.25

Loan characteristics	Number of loans	Mean	Median	Std. dev
Spread	10,911	202	100	167
Loan amount	10,911	287	165	958
Maturity	10,911	6.1	5	3.9
Collateral	10,911	0.31	0	0.46
Guaranteed	10,911	0.01	0	0.11

[1]Total assets are in million EUR. Spread is measured as basis points over LIBOR. Maturity is in years.

Table 2

The impact of banks' securitization activity on loan price

This table reports the coefficient estimates for OLS regressions estimating the impact of bank securitization activity on the price of syndicated loans. The dependent variable is the loan spread measured in basis points over LIBOR. Securitization active takes the value of 1 if the bank securitised any assets in the year when the loan is syndicated and 0 otherwise. Less active takes the value of 1 if the bank's securitization level is below the median value of all banks' securitization volume and 0 otherwise. More active takes the value of 1 if the bank's securitization level is above the median value of all banks' securitization volume and 0 otherwise. Log loan size is the natural logarithm of the amount of the loan. Maturity short takes the value of 1 if the maturity of the loan is below one year and 0 otherwise. Maturity long takes the value of 1 if the maturity of the loan is more than three year and 0 otherwise. Guarantee takes the value of 1 if the loan is guaranteed by a third party and 0 otherwise. Collateral takes the value of 1 if the loan has collateral and 0 otherwise. Log total assets is the logarithm of bank's total assets. Equity to total assets is calculated as the ratio of total equity to total assets. Return on assets is the net income divided by total assets. Loan purpose is controlled for using dummy variables categorised as general corporate use, capital structure, project finance, transport finance, corporate control and property finance. Borrower credit quality is controlled for using credit rating assigned to the borrower in the year when the loan is granted. Business Industry is controlled for using dummy variables categorised as construction and property, high-tech industry, infrastructure, population related services, state, manufacturing and transport. Year fixed effects is included for the years 2000 to 2009. Robust standard errors are reported in parenthesis. ***, ** and * represents significance levels at 1%, 5% and 10%, respectively.

	OLS				OLS with bank fixed effects			
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
Securitization active	-7.21*** (0.96)		-4.27*** (1.01)		-7.47 (5.03)		-8.02* (4.85)	
Less active		-7.73*** (1.17)		-5.67*** (1.18)		-8.75** (4.55)		-10.08** (4.92)
More active		-6.74*** (1.17)		-2.83** (1.25)		-4.96 (7.96)		-4.07 (6.63)
Loan characteristics								
Log loan size	-8.86*** (0.28)	-8.86*** (0.28)	-8.66*** (0.31)	-8.66*** (0.31)	-9.81*** (0.89)	-9.81*** (0.89)	-9.74*** (1.00)	-9.73*** (1.00)
Maturity short	-15.1*** (1.28)	-15.08*** (1.28)	-15.51*** (1.47)	-15.49*** (1.47)	-16.53*** (1.74)	-16.66*** (5.01)	-16.28*** (2.00)	-16.18*** (2.04)
Maturity long	8.41*** (1.00)	8.41*** (1.00)	7.66*** (1.13)	7.65*** (1.11)	7.62*** (1.87)	7.61*** (1.87)	8.26*** (2.08)	8.28*** (2.09)
Guarantee	-4.64* (2.41)	-4.62* (2.41)	-5.58* (2.87)	-5.55* (2.88)	-6.71 (4.18)	-6.69 (4.17)	-9.21* (5.25)	-9.24* (5.22)
Collateral	11.36*** (1.20)	11.36*** (1.20)	11.39*** (1.30)	11.36*** (1.30)	10.57*** (2.61)	10.58*** (2.61)	10.96*** (2.83)	10.98*** (2.83)
Bank Characteristics								
Log total assets			-1.35*** (0.29)	-1.42*** (0.29)			20.25*** (6.10)	20.94*** (6.12)
Equity to total assets			0.51*** (0.09)	0.52*** (0.09)			0.65 (0.50)	0.68 (0.51)
Return on assets			-2.21*** (0.54)	-2.16*** (0.53)			-1.81 (3.85)	-1.71 (3.86)
Control for:								
Loan purpose	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower credit rating	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.31	0.32	0.31	0.31				
F-test (p-values)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number of observations	84,926	84,926	84926	84926	84926	84926	84926	84926
Number of groups					406	406	406	406

Table 3

Bank size and the impact of banks' securitization activity on loan price

This table reports the coefficient estimates for OLS fixed effects regressions estimating the impact of bank securitization activity on the price of syndicated loans. The dependent variable is the loan spread measured in basis points over LIBOR. Securitization active takes the value of 1 if the bank securitised any assets in the year when the loan is syndicated and 0 otherwise. Less active takes the value of 1 if the bank's securitization level is below the median value of all banks' securitization volume and 0 otherwise. More active takes the value of 1 if the bank's securitization level is above the median value of all banks' securitization volume and 0 otherwise. Bank size is grouped by using the median assets size. Log loan size is the natural logarithm of the amount of the loan. Maturity short takes the value of 1 if the maturity of the loan is below one year and 0 otherwise. Maturity long takes the value of 1 if the maturity of the loan is more than three year and 0 otherwise. Guarantee takes the value of 1 if the loan is guaranteed by a third party and 0 otherwise. Collateral takes the value of 1 if the loan has collateral and 0 otherwise. Log total assets is the logarithm of bank's total assets. Equity to total assets is the level of bank's total equity divided by total assets. Return on assets is the net income divided by total assets. Loan purpose is controlled for using dummy variables categorised as general corporate use, capital structure, project finance, transport finance, corporate control and property finance. Borrower credit quality is controlled for using credit rating assigned to the borrower in the year when the loan is granted. Business Industry is controlled for using dummy variables categorised as construction and property, high-tech industry, infrastructure, population related services, state, manufacturing and transport. Year fixed effects is included for the years 2000 to 2009. Robust standard errors are reported in parenthesis. ***, ** and * represents significance levels at 1%, 5% and 10%, respectively.

	Small banks								Large banks							
	Active in the securitization market				Intensity of securitization				Active in the securitization market				Intensity of securitization			
	(I)		(II)		(III)		(IV)		(V)		(VI)		(VII)		(VIII)	
Securitization active	-1.75	(9.12)	-1.63	(9.47)					-9.82*	(5.95)	-9.61*	(5.56)				
Less active					-1.84	(8.84)	1.73	(9.28)					-11.44**	(5.32)	-13.05**	(5.69)
More active					-1.48	(15.2)	1.31	(14.4)					-6.98	(8.73)	-3.77	(7.36)
Loan characteristics																
Log loan size	-9.34***	(0.99)	-9.34***	(0.99)	-9.34***	(0.99)	-9.34***	(0.99)	-10.16***	(1.27)	-9.76***	(1.64)	-10.16***	(1.27)	-9.75***	(1.65)
Maturity short	-17.77***	(2.11)	-17.41***	(2.10)	-17.77***	(2.12)	-17.39***	(2.12)	-16.31***	(1.72)	-14.61***	(3.27)	-15.55***	(5.61)	-14.14***	(3.39)
Maturity long	9.38***	(2.86)	9.76***	(2.91)	9.38***	(2.87)	9.76***	(2.92)	7.31***	(2.41)	9.94***	(3.47)	7.31***	(2.41)	10.11***	(3.51)
Guarantee	-8.85	(5.97)	-9.27	(5.97)	-8.86	(5.97)	-9.28	(5.97)	-4.64	(4.61)	-11.02*	(5.99)	-4.59	(4.60)	-11.14*	(5.97)
Collateral	5.12	(3.54)	5.44	(3.50)	5.13	(3.53)	5.45	(3.49)	13.81***	(2.97)	15.14***	(3.59)	13.79***	(2.96)	15.11***	(3.58)
Bank Characteristics																
Log total assets			9.55	(6.63)			9.57	(6.68)			54.15***	(12.9)			57.05***	(13.2)
Equity to total assets			-0.15	(0.46)			-0.15	(0.46)			13.28***	(0.48)			13.86**	(5.50)
Return on assets			1.09	(2.58)			1.09	(2.56)			-21.68**	(10.4)			-21.24*	(10.7)
Control for:																
Loan purpose	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Borrower credit rating	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Borrower industry	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
F-test (p-values)	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Number of observations	13,772		13,772		13772		13772		71,154		71,154		71,154		71,154	
Number of groups	203		203		203		203		203		203		203		203	

Table 4

Pre-crisis bank securitization activity and loan price

This table reports the coefficient estimates for OLS fixed effects regressions estimating the impact of bank securitization activity on the price of syndicated loans. The dependent variable is the loan spread measured in basis points over LIBOR. Securitization active takes the value of 1 if the bank securitised any assets in the year when the loan is syndicated and 0 otherwise. Less active takes the value of 1 if the bank's securitization level is below the median value of all banks' securitization volume and 0 otherwise. More active takes the value of 1 if the bank's securitization level is above the median value of all banks' securitization volume and 0 otherwise. Log loan size is the natural logarithm of the amount of the loan. Pre-crisis period takes the value of 1 for the loans issued in 2005, 2006 and the first six months of 2007 and 0 otherwise. Maturity short takes the value of 1 if the maturity of the loan is below one year and 0 otherwise. Maturity long takes the value of 1 if the maturity of the loan is more than three year and 0 otherwise. Guarantee takes the value of 1 if the loan is guaranteed by a third party and 0 otherwise. Collateral takes the value of 1 if the loan has collateral and 0 otherwise. Log total assets is the logarithm of bank's total assets. Equity to total assets is the level of bank's total equity divided by total assets. Return on assets is the net income divided by total assets. Loan purpose is controlled for using dummy variables categorised as general corporate use, capital structure, project finance, transport finance, corporate control and property finance. Borrower credit quality is controlled for using credit rating assigned to the borrower in the year when the loan is granted. Business Industry is controlled for using dummy variables categorised as construction and property, high-tech industry, infrastructure, population related services, state, manufacturing and transport. Year fixed effects is included for the years 2000-2004 and 2008-2009. Robust standard errors are reported in parenthesis. ***, ** and * represents significance levels at 1%, 5% and 10%, respectively.

	Active in the securitization market								Intensity of securitization							
	(I)		(II)		(III)		(IV)		(V)		(VI)		(VII)		(VIII)	
Securitization active	-4.42	(3.06)	-4.61	(3.10)	-3.10	(3.13)	-3.35	(3.28)								
Less active									-5.08*	(2.93)	-5.54*	(3.12)	-4.58	(3.19)	-5.22	(3.39)
More active									-3.11	(4.35)	-2.88	(4.17)	-0.37	(4.33)	0.01	(4.15)
Pre-crisis period	-68.91***	(3.12)	-67.47***	(3.25)	-67.18***	(3.44)	-65.85***	(3.59)	-68.48***	(3.15)	-67.31***	(3.33)	-66.59***	(3.52)	-64.99***	(3.69)
Pre-crisis period * securitization active					-3.33	(3.69)	-3.16	(3.92)								
Pre-crisis period * less active													2.08	(3.49)	-1.62	(3.68)
Pre-crisis period * more active													-5.51	(4.69)	-5.84	(4.92)
Loan characteristics																
Log loan size	-9.21***	(0.95)	-9.12***	(1.05)	-9.21***	(0.95)	-9.12***	(1.05)	-9.21***	(0.95)	-9.13***	(1.05)	-9.21***	(0.95)	-7.95***	(0.31)
Maturity short	-14.83***	(1.52)	-14.96***	(1.79)	-14.84***	(1.52)	-14.97***	(1.79)	-14.81***	(1.52)	-14.91***	(1.81)	-14.83***	(1.53)	-13.89***	(1.37)
Maturity long	13.11***	(1.59)	13.23***	(1.77)	13.12***	(1.59)	13.25***	(1.77)	13.12***	(1.53)	13.23***	(1.78)	13.12***	(1.58)	13.65***	(1.04)
Guarantee	-9.11***	(3.71)	-11.94**	(4.76)	-9.12**	(3.72)	-11.91**	(4.76)	-9.11**	(3.72)	-11.95**	(4.76)	-9.11**	(3.72)	-8.54***	(2.64)
Collateral	13.14***	(2.59)	12.41***	(2.82)	12.38***	(2.61)	12.42***	(2.83)	12.38***	(2.61)	12.42***	(2.83)	12.39***	(2.61)	13.21***	(1.31)
Bank Characteristics																
Log total assets			5.72	(3.88)			5.62	(3.95)			6.06	(3.91)			6.26	(3.98)
Equity to total assets			0.04	(0.35)			0.04	(0.35)			0.06	(0.35)			0.06	(0.35)
Return on assets			-0.19	(2.40)			-0.22	(2.40)			-0.14	(2.41)			-0.13	(2.42)
Control for:																
Loan purpose	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Borrower credit rating	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Borrower industry	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
F-test (p-values)	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Number of observations	84,926		84,926		84,926		84,926		84,926		84,926		84,926		84,926	
Number of groups	406		406		406		406		406		406		406		406	

Table 5

Bank size and the impact of securitization activity on loan price during the pre-crisis period

This table reports the coefficient estimates for OLS fixed effects regressions estimating the impact of bank securitization activity on the price of syndicated loans. The dependent variable is the loan spread measured in basis points over LIBOR. Securitization active takes the value of 1 if the bank securitised any assets in the year when the loan is syndicated and 0 otherwise. Less active takes the value of 1 if the bank's securitization level is below the median value of all banks' securitization volume and 0 otherwise. More active takes the value of 1 if the bank's securitization level is above the median value of all banks' securitization volume and 0 otherwise. Bank size is grouped by using the median assets size. Log loan size is the natural logarithm of the amount of the loan. Pre-crisis period takes the value of 1 for the loans issued in 2005, 2006 and the first six months of 2007 and 0 otherwise. Maturity short takes the value of 1 if the maturity of the loan is below one year and 0 otherwise. Maturity long takes the value of 1 if the maturity of the loan is more than three year and 0 otherwise. Guarantee takes the value of 1 if the loan is guaranteed by a third party and 0 otherwise. Collateral takes the value of 1 if the loan has collateral and 0 otherwise. Log total assets is the logarithm of bank's total assets. Equity to total assets is the level of bank's total equity divided by total assets. Return on assets is the net income divided by total assets. Loan purpose is controlled for using dummy variables categorised as general corporate use, capital structure, project finance, transport finance, corporate control and property finance. Borrower credit quality is controlled for using credit rating assigned to the borrower in the year when the loan is granted. Business Industry is controlled for using dummy variables categorised as construction and property, high-tech industry, infrastructure, population related services, state, manufacturing and transport. Year fixed effects is included for the years 2000-2004 and 2008-2009. Robust standard errors are reported in parenthesis. ***, ** and * represents significance levels at 1%, 5% and 10%, respectively.

	Small banks								Large banks							
	Active in the securitization market				Intensity of securitization				Active in the securitization market				Intensity of securitization			
	(I)		(II)		(III)		(IV)		(V)		(VI)		(VII)		(VIII)	
Securitization active	3.01	(6.54)	4.21	(3.68)					-5.27	(3.58)	-5.66	(3.86)				
Less active					1.55	(5.17)	1.72	(5.29)					-7.08*	(3.74)	-8.28*	(4.25)
More active					10.04	(20.6)	10.19	(20.3)					-2.23	(4.92)	-1.25	(4.59)
Pre-crisis period	-74.38***	(5.36)	-74.45***	(4.84)	-73.33***	(6.17)	-73.24***	(5.76)	-66.35***	(3.99)	-62.01***	(4.46)	-65.63***	(4.03)	-60.78***	(4.34)
Pre-crisis period * securitization active	-12.61*	(6.84)	-9.77	(7.48)					-1.73	(3.99)	-0.36	(7.04)				
Pre-crisis period * less active					-8.18	(7.29)	-7.11	(7.93)					-0.31	(3.94)	-1.07	(4.15)
Pre-crisis period * more active					-21.32	(20.4)	-18.81	(20.7)					-4.14	(4.78)	-3.34	(5.34)
Loan characteristics																
Log loan size	-8.85***	(0.99)	-8.85***	(1.00)	-8.85***	(0.99)	-8.85***	(1.00)	-9.48***	(1.36)	-9.24***	(1.69)	-9.48***	(1.36)	-9.26***	(1.69)
Maturity short	-17.06***	(1.95)	-16.95***	(1.95)	-17.06***	(1.95)	-16.96***	(1.96)	-13.52***	(2.29)	-13.22***	(3.04)	-13.49***	(2.31)	-13.03***	(3.11)
Maturity long	13.11***	(2.51)	13.04***	(2.54)	13.11***	(2.51)	13.04***	(2.54)	13.36***	(2.04)	14.28***	(2.86)	13.33***	(2.03)	14.28***	(2.86)
Guarantee	-12.04**	(5.66)	-11.97**	(5.66)	-12.03**	(5.66)	-11.96**	(5.66)	-6.85*	(3.98)	-13.06**	(5.49)	-6.77*	(3.98)	-12.99**	(5.53)
Collateral	6.67*	(3.57)	6.79*	(3.55)	6.67*	(3.56)	6.79*	(3.54)	15.64***	(3.00)	15.14***	(3.59)	15.65***	(3.00)	16.31***	(3.64)
Bank Characteristics																
Log total assets			0.24	(4.01)			9.57	(6.68)			29.63***	(8.37)			57.05***	(13.2)
Equity to total assets			-0.44	(0.33)			-0.15	(0.46)			8.71**	(4.06)			13.86**	(5.50)
Return on assets			1.32	(1.68)			1.09	(2.56)			-12.77*	(7.16)			-21.24*	(10.7)
Control for:																
Loan purpose	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Borrower credit rating	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Borrower industry	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
F-test (p-values)	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Number of observations	13,772		13,772		13,772		13,772		71,154		71,154		71,154		71,154	
Number of groups	203		203		203		203		203		203		203		203	

Table 6

Securitized versus non-securitized loans

This table reports the coefficient estimates for OLS fixed effects regressions estimating the impact of bank securitization activity on the price of syndicated loans. The dependent variable is the loan spread measured in basis points over LIBOR. Less active takes the value of 1 if the bank's securitization level is below the median value of all banks' securitization volume and 0 otherwise. More active takes the value of 1 if the bank's securitization level is above the median value of all banks' securitization volume and 0 otherwise. Log loan size is the natural logarithm of the amount of the loan. Maturity short takes the value of 1 if the maturity of the loan is below one year and 0 otherwise. Maturity long takes the value of 1 if the maturity of the loan is more than three year and 0 otherwise. Guarantee takes the value of 1 if the loan is guaranteed by a third party and 0 otherwise. Collateral takes the value of 1 if the loan has collateral and 0 otherwise. Log total assets is the logarithm of bank's total assets. Equity to total assets is the level of bank's total equity divided by total assets. Return on assets is the net income divided by total assets. Loan purpose is controlled for using dummy variables categorised as general corporate use, capital structure, project finance, transport finance, corporate control and property finance. Borrower credit quality is controlled for using credit rating assigned to the borrower in the year when the loan is granted. Business Industry is controlled for using dummy variables categorised as construction and property, high-tech industry, infrastructure, population related services, state, manufacturing and transport. Year fixed effects is included for the years 2005 to 2009. Robust standard errors are reported in parenthesis. ***, ** and * represents significance levels at 1%, 5% and 10%, respectively.

	Securitized loans				Non-securitized loans			
	(I)		(II)		(III)		(IV)	
Less active	-14.96*	(7.99)	-13.49**	(6.50)	-31.33**	(15.9)	-23.88**	(10.6)
More active	-8.22	(11.3)	-3.74	(9.01)	-11.23	(22.6)	-3.97	(11.5)
Loan characteristics								
Log loan size	-10.98***	(1.34)	-11.06***	(1.36)	-8.73***	(0.99)	-7.54***	(1.36)
Maturity short	-19.36***	(7.33)	-11.34	(7.94)	-18.76***	(4.38)	-11.21***	(5.02)
Maturity long	-13.35**	(5.51)	-2.49	(6.13)	-25.58***	(3.26)	13.61***	(4.14)
Guarantee	-77.53***	(12.6)	-91.29***	(13.6)	25.21***	(9.39)	12.51	(9.63)
Collateral	-37.15***	(4.72)	-34.81***	(4.81)	3.29	(3.79)	8.58*	(4.38)
Bank Characteristics								
Log total assets			64.43***	(13.4)			127.16***	(27.8)
Equity to total assets			1.24	(0.94)			3.57	(2.63)
Return on assets			-5.24**	(2.36)			-15.39**	(6.92)
Control for:								
Loan purpose	Yes		Yes		Yes		Yes	
Borrower credit rating	Yes		Yes		Yes		Yes	
Borrower industry	Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes	
F-test (p-values)	0.000		0.000		0.000		0.000	
Number of observations	17,087		17,087		22,403		22,403	
Number of groups	94		94		94		94	

Table 7

Securitized versus non-securitized loans in large banks

This table reports the coefficient estimates for OLS fixed effects regressions estimating the impact of bank securitization activity on the price of syndicated loans. The dependent variable is the loan spread measured in basis points over LIBOR. Less active takes the value of 1 if the bank's securitization level is below the median value of all banks' securitization volume and 0 otherwise. More active takes the value of 1 if the bank's securitization level is above the median value of all banks' securitization volume and 0 otherwise. Bank size is grouped by using the median assets size. Log loan size is the natural logarithm of the amount of the loan. Maturity short takes the value of 1 if the maturity of the loan is below one year and 0 otherwise. Maturity long takes the value of 1 if the maturity of the loan is more than three year and 0 otherwise. Guarantee takes the value of 1 if the loan is guaranteed by a third party and 0 otherwise. Collateral takes the value of 1 if the loan has collateral and 0 otherwise. Log total assets is the logarithm of bank's total assets. Equity to total assets is the level of bank's total equity divided by total assets. Return on assets is the net income divided by total assets. Loan purpose is controlled for using dummy variables categorised as general corporate use, capital structure, project finance, transport finance, corporate control and property finance. Borrower credit quality is controlled for using credit rating assigned to the borrower in the year when the loan is granted. Business Industry is controlled for using dummy variables categorised as construction and property, high-tech industry, infrastructure, population related services, state, manufacturing and transport. Year fixed effects is included for the years 2005 to 2009. Robust standard errors are reported in parenthesis. ***, ** and * represents significance levels at 1%, 5% and 10%, respectively.

	Securitized loans				Non-securitized loans			
	(I)		(II)		(III)		(IV)	
Less active	-15.01*	(8.62)	-11.02*	(6.41)	-36.04**	(17.8)	-21.64**	(11.1)
More active	-8.69	(10.2)	-1.23	(8.42)	-16.22	(23.1)	-2.98	(9.43)
Loan characteristics								
Log loan size	-10.44***	(1.39)	-10.86***	(1.35)	-8.72***	(1.11)	-6.46***	(1.41)
Maturity short	-33.31**	(5.19)	-6.21	(8.41)	-18.29***	(4.91)	-5.49	(4.55)
Maturity long	-13.17**	(6.08)	3.02	(6.35)	-24.02***	(3.84)	-7.77**	(3.09)
Guarantee	-67.88***	(13.4)	-17.26**	(8.17)	34.13**	(10.9)	10.05	(9.52)
Collateral	-33.31***	(5.19)	13.96***	(4.82)	5.89	(4.01)	-11.80**	(4.56)
Bank Characteristics								
Log total assets			96.03***	(14.5)			175.09***	(13.8)
Equity to total assets			5.37	(4.14)			9.99	(6.10)
Return on assets			-7.25	(6.77)			-22.52**	(9.88)
Control for:								
Loan purpose	Yes		Yes		Yes		Yes	
Borrower credit rating	Yes		Yes		Yes		Yes	
Borrower industry	Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes	
F-test (p-values)	0.000		0.000		0.000		0.000	
Number of observations	14,379		14,379		19,128		19,128	
Number of groups	47		47		47		47	

Table 8

Securitized versus non-securitized loans in large banks during pre-crisis period

This table reports the coefficient estimates for OLS fixed effects regressions estimating the impact of bank securitization activity on the price of syndicated loans. The dependent variable is the loan spread measured in basis points over LIBOR. Less active takes the value of 1 if the bank's securitization level is below the median value of all banks' securitization volume and 0 otherwise. More active takes the value of 1 if the bank's securitization level is above the median value of all banks' securitization volume and 0 otherwise. Bank size is grouped by using the median assets size. Log loan size is the natural logarithm of the amount of the loan. Pre-crisis period takes the value of 1 for the loans issued in 2005, 2006 and the first six months of 2007 and 0 otherwise. Maturity short takes the value of 1 if the maturity of the loan is below one year and 0 otherwise. Maturity long takes the value of 1 if the maturity of the loan is more than three year and 0 otherwise. Guarantee takes the value of 1 if the loan is guaranteed by a third party and 0 otherwise. Collateral takes the value of 1 if the loan has collateral and 0 otherwise. Log total assets is the logarithm of bank's total assets. Equity to total assets is the level of bank's total equity divided by total assets. Return on assets is the net income divided by total assets. Loan purpose is controlled for using dummy variables categorised as general corporate use, capital structure, project finance, transport finance, corporate control and property finance. Borrower credit quality is controlled for using credit rating assigned to the borrower in the year when the loan is granted. Business Industry is controlled for using dummy variables categorised as construction and property, high-tech industry, infrastructure, population related services, state, manufacturing and transport. Robust standard errors are reported in parenthesis. ***, ** and * represents significance levels at 1%, 5% and 10%, respectively.

	Securitized loans				Non-securitized loans			
	(I)		(II)		(III)		(IV)	
Less active	-9.31	(16.6)	-11.25	(15.6)	-24.82***	(9.07)	-28.93***	(9.86)
More active	-5.53	(7.44)	-3.33	(7.44)	-9.08	(8.25)	-8.34	(7.76)
Pre-crisis period	-68.68***	(8.15)	-54.27***	(9.92)	-126.27***	(7.34)	-97.20***	(7.34)
Pre-crisis period * less active	4.47	(19.1)	6.71	(18.1)	17.33*	(9.43)	22.00**	(10.0)
Pre-crisis period * more active	0.87	(9.04)	1.78	(9.01)	-2.20	(8.89)	2.07	(8.99)
Loan characteristics								
Log loan size	-11.14***	(1.36)	-11.22***	(1.34)	-6.22***	(1.33)	-6.03***	(1.36)
Maturity short	-2.21	(8.29)	0.84	(8.34)	-2.19	(4.28)	-1.68	(4.25)
Maturity long	9.13	(5.81)	12.69**	(5.98)	-3.72	(3.16)	-3.05	(3.28)
Guarantee	-102.78***	(14.5)	-107.85***	(14.7)	6.41	(8.72)	4.66	(8.79)
Collateral	-31.03***	(5.14)	-30.52***	(5.17)	11.84**	(4.59)	12.50***	(4.61)
Bank Characteristics								
Log total assets			49.07***	(13.3)			64.79***	(12.2)
Equity to total assets			2.32	(3.00)			1.70	(3.51)
Return on assets			-5.42	(4.82)			-6.90	(6.23)
Control for:								
Loan purpose	Yes		Yes		Yes		Yes	
Borrower credit rating	Yes		Yes		Yes		Yes	
Borrower industry	Yes		Yes		Yes		Yes	
F-test (p-values)	0.000		0.000		0.000		0.000	
Number of observations	14,379		14,379		19,128		19,128	
Number of groups	47		47		47		47	

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